Teaching and Learning
in Physical Therapy

FROM CLASSROOM TO CLINIC

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the information presented last (recency), it makes sense to teach the most important material first and then to conclude with a summary of the most important points.

The summary, done by the instructor, can take the form of the instructor restating key points or describing the major take-home messages for the day. Learners, too, can create the summary. In a group learning situation, participants can answer quiz questions, share key points with a neighbor, play a class-wide game in the *Jeopardy* game show format, write down the 3 most important things they learned today, or apply key information to a case. These suggestions, or any of the many possible ways described by Wormeli,[60] encourage reflection on the materials presented and foster integration into one's existing neural connections.[30,60]

Critical Thinking Clinical Scenario

You are a student physical therapist and have prepared a 45-minute in-service on the latest approaches to shoulder arthroplasty. You have included 30 minutes of lecture material and a small group activity. Just as you are about to begin, the clinical instructor tells you to finish up in 30 minutes because there are administrative announcements to be made.

Reflective Questions

1. What aspects of your presentation do you consider essential? Why?

2. What aspects of your presentation could you omit? Why?

3. If you are approaching the end of your time and you must choose between presenting the most recent, evidence-based finding or a final summary, which will you choose? Why?

Key Points to Remember

- When choosing your content, consider the purpose of the instruction, the objectives, and the audience.
- Allow sufficient time for presenting and processing content. Tailor the amount of time for processing to goals of the presentation.
- Organize the content by including what Garmston[14] referred to as containers.
- Use the principle of less is more when choosing content and length of instructional period.
- Capture your learner's attention by using the appropriate motivational hooks that are geared toward various learning preferences.
- Be sure to maintain your learner's focus with appropriate content boosters that appeal to various different learning preferences.
- Use active learning techniques to facilitate learning and retention.
- Use a summary to conclude your presentation.

Assessment

Once you have designed the optimal teaching-learning situation, with appropriate behavioral or outcome objectives, motivational hooks, content boosters, active strategies, and a summary, you have one final task. You need to determine how you will know whether your learners learned what you expected them to learn. How do you do this? How will you determine whether or not learners can demonstrate mastery of the expected outcomes? Assessment, in its several forms, provides the answer.

Assessment can occur at several points in the learning experience. You are probably most familiar with summative assessments that happen at the end of a course or a unit of instruction and result in a grade. Summative assessments focus on determining how well the students learned the content presented.[60] Summative assessments provide the evidence you need to be able to make a judgment about student learning.[63]

As we noted earlier, the behavioral or outcome objectives you developed for your presentation, course, or internship provide the basis not only for how you design your learning activities but for how you design your assessment strategies. It is critical to have a direct link from your behavioral objectives to your outcome assessments. If you expect your learner to perform at the analysis level of Bloom's taxonomy, your instruction should be designed to facilitate that level of achievement and your assessments should be designed to assess that level of performance. Similarly, if your outcome objectives are in the psychomotor domain, your assessments should include assessment of psychomotor skills. For example, if your stated objective is "The learner will perform a complete patient history efficiently," it is not enough for you to assess your learner's knowledge of how to perform a compete history; your assessment must include the actual performance of the history itself. Unfortunately, mismatches are not uncommon. We have seen instructors develop outcome objectives related to problem solving and then design fine case-based teaching strategies to facilitate the development of problem-solving skills in their learners; but, when it came to the summative assessment, the instructor used all lower-level factual questions to assess their learners' performance. This type of mismatch often leads to frustration on the part of the learner—particularly if the learner is being graded.[24,64] Keeping the verbs of the behavioral objectives in mind when developing your summative assessment may help prevent these types of mismatches from occurring.

Key Points to Remember

There should always be a direct link between:

- The behavioral objectives and the strategies used for instruction.
- The behavioral objectives and the strategies used for assessment.

Summative assessment is about collecting data on student performance to determine whether the stated behavioral objectives have been met. For data collection to be effective and meaningful, the right type of data must be collected. Data that include direct or observable evidence of student learning will most clearly substantiate the degree to which learning has occurred.[64] Samples of direct evidence of student performance in the physical therapy classroom include scores on multiple-choice and essay exams, practical exams, simulations and standardized patient encounters, electronic discussion threads, portfolios, and student reflections. In the clinic, ratings on instruments such as the *Clinical Performance Instrument*[65] provide further direct evidence of student behavior and learning. Finally, standardized exams such as the National Physical Therapy Exam (NPTE) provide evidence of learning at the end of the curriculum.

Two basic types of data collection methods have been described in educational literature: objective and subjective assessment.[64] *Objective assessments* typically have 1 right answer and require very little professional judgment in actual scoring. A good example of an objective assessment is the multiple-choice exam. *Subjective assessments*, on the other hand, do require some degree of judgment because they often allow for multiple approaches to the problem. Good examples of subjective assessments are essays, reflective writing, portfolios, practical exams, and simulations. Though each student may receive the same case on a practical exam or the same patient in the clinical setting, how they each approach the patient and the process they use to address the problem may be quite variable. Truthfully, even objective assessments have some degree of subjectivity. Professional judgment is required in determining what questions to ask, how to ask them, how they should be interpreted, and how they should be scored.[64] Similarly, we strive to make subjective assessments as objective and fair as possible. As you will read later in this chapter, the objectivity of some more subjective exams and assignments may be enhanced by using rubrics.

Each type of assessment has its advantages as well. For example, objective assessments such as multiple-choice exams generally cover a broad range of content in a short period of time, are easily scored, are efficient, and result in a numerical value. Alternatively, more subjective assessments such as essays and certain types of practical exams can more easily reveal the learner's values and beliefs, thought processes, problem-solving skills, and performance/psychomotor skills. Each has its place in the physical therapy curriculum. Regardless of the type of assessment used, some degree of objectivity is essential to fair and unbiased grading. In addition, it should be remembered that there are no perfect assessments and students have different learning styles, so to obtain an accurate assessment of the learner, we encourage you to use multiple sources of evidence and multiple types of assessment.[66]

Key Points to Remember

The 2 types of summative assessments:

- Objective assessments typically have 1 right answer and require very little professional judgment in actual scoring.
  - Advantages include the following:
    - Cover a broad range of content in a short period of time
    - Easily scored
    - Efficient
    - Result in a numerical value
- Subjective assessments often allow for multiple approaches to the problem and require some degree of judgment in scoring.
  - Advantages include the following:
    - This type of assessment more easily reveals the learner's values, problem-solving skills, beliefs, thought processes, performance skills, and psychomotor skills
- Regardless of the type of assessment used, some degree of objectivity is essential to fair and unbiased grading.
- To obtain an accurate assessment of the learner, multiple sources of evidence and multiple types of assessment should be used.

Entire texts have been written on designing effective assessment strategies, and we encourage you to review some of these texts as you design your own assessments.[24,64,67,68] What we will present here are some of the most common types of summative assessments used in physical therapy education along with a mechanism for fairly and effectively judging performance. Given that the NPTE is a multiple-choice exam, many programs integrate this type of objective assessment throughout the curriculum. Not all content can be assessed easily using a multiple-choice format, however, so more subjective types of assessment such as practical exams, simulations, and standardized patients, written essays, group work, and presentations are also included. To optimize equity and ease of grading, we advocate the use of rubrics when using subjective assessments. Here, we will address the design and development of both multiple-choice questions and rubrics.

Writing Good Multiple-Choice Exams

Effective assessments begin with well-written behavioral objectives or learning outcomes—remember, begin with the end in mind! In developing multiple-choice

exams, it is important to start with a blueprint. A *blueprint* is your outline or plan for the design of your assessment.[64,69] Blueprints help ensure that the test you design:

- Assesses all of the expected learning outcomes.
- Appropriately emphasizes the learning outcomes based on their importance (ie, you will want to weigh the importance of each of the learning outcomes).
- Assesses your learner at the level of your teaching and your expected outcome (eg, analysis or application versus knowledge or comprehension).
- Assesses your learner in the domain of your teaching and your expected outcome (ie, cognitive).
- Is comprehensive without consisting of trivial content.[64]

To develop a blueprint, begin with the established learning objectives as outlined in your syllabus. You want to review the objectives along with the materials you presented in class to determine which learning objectives are most important and which ones you emphasized in your teaching. Assign a point value or percentage to each learning objective (ie, the percentage or number of questions that need to be designed for each learning objective) based on your determination of importance. Your blueprint will tell you how many and what types of questions you will need to write to assess each of the expected learning outcomes. From this blueprint, you can begin writing your questions. As you develop your exam, it is important to note that depending on the level of complexity, learners generally can complete 1 to 2 multiple-choice questions per minute.[70] Giving your test blueprint to your students may help them focus their studies as well.[64]

Writing good multiple-choice questions can be challenging, but it is always important to remember that your goal is to assess learning, not trick your students. Some principles to consider before you even begin to write multiple-choice questions can be found in Table 4-16.[64,66,69-72]

Multiple-choice questions consist of the following:
- *Stem*: Which is the direct question or incomplete statement that leads into the answer
- *Responses or options*: Which are the possible choices for the learner
- *Distracters or foils*: Which are the incorrect options
- *Key*: Which is the correct response

In writing the stem, be sure that it does not include extraneous content or grammatical clues that might lead the learner to answer the question without having to fully process it. Avoid negatives, particularly double negatives whenever possible. If this cannot be avoided be sure to capitalize or bold such words as *except* or *not*. Avoid abbreviations and jargon, except where appropriate. The learner should be able to answer the stem question or finish the stem statement without reading all of the options.[64,69] Stems that are complete sentences or questions tend to be clearer and less ambiguous than incomplete sentences or fill-in-the-blanks.[70]

In writing the responses or options and the key, there should be 1 best answer. Responses should be placed in a logical sequence (eg, alphabetical, chronological). Responses should be about the same length and should be similar in format; any discrepancies in length or format may give the savvy test-taker clues. Options should be relatively short; long options tend to be confusing and hard to follow. Be sure that the correct response does not repeat words from the stem and that none of the responses overlap. It is also best to avoid using statements such as "all of the above" and "none of the above."[64,69,73]

Finally, the distracters or foils should all be plausible. The number of options in any multiple-choice exam may vary. It has been suggested that 3 to 5 options is optimal,[70] and on the NPTE most multiple-choice questions have 4 response options. More important than the number of options, however, is the plausibility of the options. If you cannot develop plausible distracters, it

Table 4-16. Principles of Writing Effective Multiple-Choice Questions

- Avoid tricky, grammatically incorrect, or otherwise imprecise language—you do not want your learners to select the wrong answer because of poorly worded instructions or questions.
- Avoid vague, imprecise, or absolute terms such as *always, never, some, few,* etc.
- Avoid overlapping questions (ie, questions that can provide clues to other answers).
- Avoid linking questions (ie, questions that require the learner to know the answer to one question in order to answer another correctly).
- Avoid trivial questions.
- Focus on the content you have identified as important in your blueprint.
- Include as many questions as possible; as the number of questions increases, the variability due to guessing decreases.
- Be sure your blueprint and subsequent exam are comprehensive; otherwise, rather than assessing learning, you may be assessing the degree to which a student determined the "right" material to study for the exam.
- Have a colleague peer review your exam for clarity, grammar, spelling, etc.

is better to use fewer options rather than resorting to implausible or trivial distracters. Implausible, trivial, or otherwise nonfunctional distracters simply waste the learner's time.[74] The best distracters consist of common errors or common misperceptions, not tricky or deceptive answers.[64,69,70]

Stop, Do, and Reflect

Earlier in this chapter, we presented 3 learning objectives that you might typically see in a physical therapy curriculum. For each learning objective or outcome, develop at least 1 well-written multiple-choice question to assess the learners.

1. After this laboratory session, the student will correctly list 5 contraindications to using ultrasound as an intervention.

2. By the end of this clinical internship, the student will integrate the core value of professionalism into her daily interactions.

3. At the end of this course, the student will safely transfer patients from the bed to a wheelchair.

Some multiple-choice exams also include a number of scenario-based questions, also called *context-dependent* or *enhanced* multiple-choice questions.[70] This consists of a patient scenario followed by one or more multiple-choice questions related to that scenario. This requires the learner to interpret the scenario before answering any of the questions. There are advantages to this type of multiple-choice question because it tends to focus on important, realistic concepts and often requires a degree of problem solving and decision making at the higher levels of Bloom's taxonomy.[70] The key to writing these types of questions is to make the scenario realistic. You also do not want the learner to get caught up in reading a very long passage before answering the questions because this can be time consuming, particularly for the slower reader.[64] Context-dependent questions can be developed using items such as x-rays, statistical tables, or pictures of actual patients rather than a long narrative scenario. The following is an example of a well-written context-dependent multiple-choice question that might be found on the NPTE[75]:

A physical therapist treating a patient overhears two of his colleagues discussing another patient's case in the charting area. The therapist is concerned that patients may overhear the conversation. The MOST appropriate action is to

1. Discuss the situation with the director of rehabilitation
2. Discuss confidentiality at the next staff meeting
3. Move the patient away from the charting area
4. Inform the physical therapists that their conversation may be audible to the patients

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Stop, Do, and Reflect

You have just completed a unit on reflective practice. Your primary goal for the unit was to have students apply the principles of reflective practice to real-world scenarios.

Based on the concepts presented on developing on effective multiple-choice questions, critique the following multiple-choice question:

_____ is NOT one of the elements of reflective practice espoused by Jack Mezirow:
   A) Reflection-in-action
   B) Premise reflection
   C) Content reflection
   D) None of the above

Finally, once you have given your exam, it is optimal to complete a post-test analysis. Psychometric analysis of exams is outside the scope of this section because it can become quite complex quickly. What we provide here are a few simple concepts to get you started, and we encourage you to consider this an area of ongoing study if you will be writing and administering tests frequently. Ideally, you will have access to a computerized statistical analysis of your exam. This analysis will allow you to assess each question for 2 key characteristics: difficulty and discrimination. *Difficulty* refers to the number of respondents who answered the question correctly. Although each question must be analyzed independently, in general, an optimal level of difficulty is when approximately 50% to 75% of the learners answer the question correctly.[70] *Discrimination* refers to the degree to which performance on any test question correlates with overall test performance (ie, the degree to which the respondents who answered that particular question correctly also performed well on the exam overall). It describes the degree to which the item distinguishes between more and less knowledgeable students. Discrimination scores range between −1.0 and +1.0 (sometimes described in percentages). Negative scores indicate that students who performed poorly on the exam answered this question correctly more often than those who scored well on the exam. Multiple-choice questions with negative discrimination scores should be revised.[70] Although sources differ on what an ideal score consists of, generally, a score of 0.5 on an item suggests that those who answered the particular question correctly were more often among the top 50% of test performers.[70]

Once you have determined the degree of difficulty and discrimination of each multiple-choice question, you will then want to make some judgments about revising your questions. If a question is too challenging or too easy, you may want to consider revising it. Of course,

these decisions must be made in the context of the teaching-learning situation. For example, you may be assessing a question on content that you consider to be very important. The question may have a high level of difficulty but also has a high level of discrimination. In this case, it is a challenging item; however, it also clearly discriminated between the highest and lowest scorers in the class, and you may not necessarily want to modify this question. On the other hand, you may have an item in which a particular distracter was never selected or was often selected. If it was never selected, it is likely that it was an implausible option. If it was chosen often, it suggests that it may actually be a correct answer. In either case, you may want to review and refine your questions.[70,71] Poorly constructed questions unnecessarily add to the difficulty of the exam and present a challenge to a meaningful interpretation of the results of the exam.[70] It is always important to remember that the goal of the exam is to assess learning, not test-taking savvy!

Stop, Do, and Reflect

You are preparing to teach a unit on the prevention of back injuries and repetitive strain injuries to a group of novice sonographers in the hospital.

- Define at least 1 learning outcome for your presentation.
- Based on your expected learning outcome, what teaching strategies might you use?
- Based on your expected learning outcome and teaching strategies, develop at least 1 multiple-choice question to assess your learners.

Key Points to Remember

In writing multiple-choice questions:
- Develop and utilize a comprehensive blueprint.
- Avoid negative and imprecise language.
- Remove all potential cues including any overlapping questions.
- Have someone peer review your exam for clarity.
- Include as many questions as possible but avoid trivia.
- Analyze results of the exam for levels of difficulty and discrimination.

Developing Effective Rubrics

As noted earlier, rubrics provide a mechanism for improving the objectivity of more subjective assessment strategies. Rubrics can clarify your expectations of student performance; can provide more detailed, consistent feedback to students about their performance; and can facilitate ease and efficiency of grading. Essentially, a rubric is a grading tool that consists of clear statements about what you are looking for in terms of content mastery plus criteria for evaluating the degree to which learners demonstrate mastery.[64,68]

Suskie[64] suggests the fist step in developing an assignment should be the development of a rubric. Just as we did earlier in this chapter, she advocates that you begin with the end in mind. Creating a rubric helps you clarify your goals for the assignment and as a result may help you develop a more focused and effective assignment. This may be a challenging task. More often than not, we create our assignments and then determine how to grade them. Using an iterative process may help. That is, determine the learning goals, create the assignment, and finally refine your goals into a more complete evaluation tool or rubric. Once you have designed your rubric you may go back again and refine the instructions to your assignment.

Key Points to Remember

Rubrics can help:
- Improve the objectivity of more subjective assessment strategies.
- Clarify your expectations of student performance.
- Provide more detailed, consistent feedback to students about their performance.
- Facilitate ease of grading.
- Facilitate efficient feedback to students.

Rubrics can also help clarify your goals for your assignments and as a result may help you develop more focused and effective assignments.

In designing a rubric, it is helpful to start with a blueprint based on the main objectives for the course or unit and the desired learner outcomes for a particular assignment, similar to how you design a blueprint for multiple-choice exams. Consider the purpose of the assignment, what outcomes you expect from the learner as a result of completing the assignment, and what level of performance learners are likely to exhibit. You might ask yourself what skills you expect the learners to have or to develop as a result of completing the assignment and what types of evidence would demonstrate that your learners have mastered the content.

Once you have reflected on the purpose of the assignment and how it supports your main objectives, you are ready to specify all the performance indicators or the criteria for determining the degree to which mastery was achieved. As you define the performance indicators, you will group them into similar objectives; for example, clarity, organization, content, originality, creativity. You need to consider all the performance indicators that allow you to assess mastery of the material. Once you

have identified the performance indicators, you then need to determine the criteria you will use to evaluate performance and determine the level of competence achieved.[64,68]

Rubrics can vary in format from simple checklists and rating scales to more comprehensive descriptions of performance outcomes and indices of mastery.[64] A checklist rubric might be helpful when you observe students in a laboratory practical exam and you are concerned about the presence or absence of specific behaviors (Table 4-17). For example, an instructor could simply check off whether or not the following behaviors were present:

- ☐ Student introduces him- or herself to the patient
- ☐ Student washes his/her hands
- ☐ Student asks about past medical history
- ☐ Student ensures patient safety throughout the treatment session.

Table 4-17. Sample Rubric for a Focused Laboratory Practical

1. Introduces him- or herself	___/	2
2. Explains purpose of interaction	___/	1
3. Previous history of back, leg, or foot pain	___/	2
4. Mechanism of injury	___/	2
Focused Patient History: Pain		
5. Onset	___/	2
6. Location	___/	2
7. Radiation	___/	2
8. Pattern (eg, constant, occasional, intermittent)	___/	2
9. Description (eg, dull, sharp, etc)	___/	2
10. Intensity	___/	2
11. Getting better or worse	___/	2
12. Aggravating factors	___/	1
13. Alleviating factors	___/	1
14. Addresses inconsistencies in patient reporting	___/	2
Blood Pressure Check		
15. Patient's arm is firmly supported	___/	1
16. Cuff placed approximately 1 inch above antecubital fossa	___/	1
17. Locates the brachial artery medial to biceps tendon	___/	1
18. Obtains palpable systolic pressure	___/	1
19. Places stethoscope firmly over brachial artery	___/	1
20. Pumps cuff to 20 to 30 mmHg above palpable systolic pressure	___/	1
21. Deflates cuff slowly, watching manometer	___/	1
22. Obtains accurate reading (accept ±4 systolic and ±2 diastolic)	___/	2
MMT of Appropriate Muscle Group		
23. Chooses appropriate muscle group	___/	2
24. Subject is placed in appropriate position	___/	2
25. PROM checked	___/	2
26. Subject asked to perform AROM	___/	2
27. Resistance is applied in appropriate direction	___/	2
28. Appropriately grades muscle group	___/	2
Total score*		/46

Adapted from a rubric used to grade an OSCE in the Introduction to Examination course at Touro College Doctor of Physical Therapy Program. MMT indicates manual muscle test; PROM, passive range of motion; AROM, active range of motion.
*Note: Any demonstration of unsafe, unprofessional, or unethical behavior will be considered an automatic failure regardless of overall score (eg, does not guard patient, puts patient at risk, or anything deemed unsafe).

Lab practical exams are often a combination of objective and subjective assessment. For example, during a lab practical, one performance criterion might be, "The student washes his/her hands." Some would consider this objective (ie, performed/not performed), requiring little professional judgment. On the other hand, if what you are assessing is the quality of performance, some degree of judgment may be required, and unless a rubric with specific performance indicators is developed, grading may be somewhat subjective (eg, wet hands first, lathered well beyond wrist, washed all surfaces and under fingernails thoroughly for at least 15 to 20 seconds, thoroughly rinsed with clean water, dried hands completely, used towel to turn off water).

Checklist rubrics may be helpful to students before submitting an assignment to determine whether they have included all necessary components. For example, the checklist might include the following expected behaviors for a research proposal:

- Citations are written in AMA format
- A minimum of 15 references are cited
- Completed IRB approval form is attached
- Abstract of 75 words is included

A rating scale rubric is similar to a checklist except that it allows the instructor to go beyond noting the presence of a behavior to indicate the degree to which the desired behaviors occurred. The ratings can be written in a variety of formats that include Likert-like scales, where the rater judges the quality of the performance such as

- Excellent, Very Good, Adequate, Marginal, Inadequate
- Excellent, Adequate, Needs Improvement
- Performed Independently, Performed with Cuing, Did Not Perform
- Almost Always, Often, Sometimes, Rarely
- Strongly Agree, Agree, Disagree, Strongly Disagree

Point values can be used to indicate how well the performance met expectations as well. Rubrics also can be helpful in the peer review process. For example, in an in-class oral presentation, the instructor as well as classmates could use a rating scale rubric with assigned point values such as the one presented in Table 4-18.

Table 4-18. Rating Scale Grading Rubric for a Group Oral Presentation

Rater's Name: _____ Students' Names:	1. _____ 2. _____ 3. _____ 4. _____					
Complete this review, using the following scale: N/O = Not observed; 1 = Unsatisfactory; 2 = Marginal; 3 = Meets Requirements; 4 = Exceeds Requirements; 5 = Exceptional						
Process	1	2	3	4	5	N/O
Speaks clearly and succinctly	☐	☐	☐	☐	☐	☐
Participation of all group members	☐	☐	☐	☐	☐	☐
Rapport with audience	☐	☐	☐	☐	☐	☐
Pace and time utilization of delivery	☐	☐	☐	☐	☐	☐
Content	1	2	3	4	5	N/O
Needs assessment (designed and implemented)	☐	☐	☐	☐	☐	☐
Motivational hook (relevant, engaging, appropriate)	☐	☐	☐	☐	☐	☐
Objectives (clearly stated in behavioral terms and appropriate number)	☐	☐	☐	☐	☐	☐
Content and sequence (well organized, logical sequence, appropriate amount of content for allotted time)	☐	☐	☐	☐	☐	☐
Content booster (appropriate, supports content, reinforces learning)	☐	☐	☐	☐	☐	☐
Summary (clearly stated; appropriately placed)	☐	☐	☐	☐	☐	☐
Active Learning Strategies	1	2	3	4	5	N/O
Active learning strategy (consider participation of all audience members)	☐	☐	☐	☐	☐	☐
Overall score						/55

Identify 1 or 2 strengths of this presentation._____
Identify 1 aspect of this presentation you suggest this group or particular individual improve upon._____

Descriptive rubrics go beyond checklists and rating scales to provide clearly delineated performance expectations; rather than simply checking off "outstanding" or "needs improvement," each rating has a full description of the expected level of achievement. Although time consuming to develop, descriptive rubrics allow the instructor to make the standards for student performance very clear. These descriptions can provide useful feedback to students, minimize confusion about the grade received on an assignment, and make it more likely that grading is consistent across students and over time.[64,68] Because descriptive rubrics clearly specify the performance expectations, they can facilitate critical thinking in students. For example, performance indicators for an "adequate" rating might include the student presents a thesis statement, provides supportive data from a variety of sources, and demonstrates analysis of multiple points of view. A discussion about these performance indicators before students work on the assignment can encourage them to complete a paper or project with a deeper level of analysis than they might have provided without the discussion or descriptive rubric. Descriptive rubrics are well suited for more complex assignments such as research papers and essays. An example of a descriptive rubric for a research paper appears in Table 4-19.

Table 4-19. Descriptive Grading Rubric for an Evidence-Based Teaching Assignment

	Meets/Exceeds Requirements	Gets By/Needs Work	Unacceptable/Not Observed
Summarizes major points of the research poster presentation or article	Summarizes key points including background, purpose, methodology, participant(s) selection, methods, data analysis, results, discussion, and conclusion	Summarizes most key points logically	Limited or inaccurate summary of key points
	10-8	7-5	<5
Critical analysis of the research methods and conclusions	Evidence of original thought and critical evaluation of the research methods and conclusions. Evaluation is accurate	Evidence of some original thought and evaluation of the research methods and conclusions. Less visible/logical links made between assertions and evidence	Limited or inaccurate evidence of original thought and critical evaluation of the research methods and conclusions; limited or inaccurate links between assertions and evidence
	10-8	7-5	<5
Relates information presented to the teaching and learning course	Strong links made between poster/article and information presented in this course	Good linkage made between poster/article and information presented in this course	Little to no linkage made between poster/article and information presented in this course
	10-8	7-5	<5
Relates information presented to future practice in PT (applies the theory to practice drawing logical conclusions based on supporting evidence)	Strong evidence of application of theoretical concepts to physical therapy practice	Good evidence of application of theoretical concepts to physical therapy practice	Little to no evidence of application of theoretical concepts to physical therapy practice
	10-8	7-5	<5
Overall: clarity and organization of submission; selected an appropriate article/poster and followed instructions	Logical sequence and transitions throughout; well written and easy to follow; article/poster related to teaching/learning. For the article review: no older than 2007; no more than 400 words, original article included in submission	Logical sequence and transitions; some spelling/grammatical errors; follows most instructions	Inconsistencies; hard to follow; multiple spelling/grammatical errors; poster/article did not relate to teaching/learning; did not follow instructions
	10-8	7-5	<5
Total points earned			/50

Adapted from a rubric used in the Teaching and Physical Therapy Practice course at the George Washington University Doctor of Physical Therapy Program.

Critical Thinking Clinical Scenario

The following is an assignment you created for class. The purpose of the assignment is for your learners to prepare for future job interviews by engaging in an authentic interview process.

Assignment

To facilitate your continued professional development and preparation for career placement, you will be participating in standardized interviews with local clinicians who routinely interview new graduates. You are to prepare for this interview by reflecting upon your ideal job and preparing some thought-provoking questions. This assignment has 3 parts.

Part I—Preparation: Given what you currently know about yourself and your chosen profession, describe your ideal job. Be as detailed as possible. In considering what you are looking for in a position and in preparation for your standardized interview

1. Develop 5 questions you anticipate being asked by your interviewer plus your response to each.

2. Develop 5 thoughtful questions you plan to ask your potential employer. These questions should go beyond the mundane such as things like salary and benefits (although these are questions that you will ultimately want answered).

Part II—The Interview: During the standardized interview process, you will observe and be observed by 2 peers. While observing your peer, you will be asked to provide effective feedback to each interviewee. Your feedback should address: appropriateness of dress; greeting; verbal communication; nonverbal communication; evidence of active listening skills; responses to interviewer's questions posed (complete, accurate, etc); complexity of the questions posed by the interviewee; closure; interpersonal skills.

Part III—Post-Interview Reflection: After completing your standardized interview:

1. Reflect on your performance and the feedback you received from your peers and from your interviewer. Self-assess and describe what you did well and what you would like to improve upon. Describe your reaction/response to the feedback you received.

2. Reflect on your initial job description. This time, consider the classroom discussion, your own personal research, and any new insights gained. What have you added? Deleted? Modified? If nothing, what alternatives have you either considered or rejected?

Reflective Activity

1. Create a rubric that will be used by peers to assess each learner's performance during the interview.

2. Create a rubric to use in assessing the learners' written assignments.

3. Compare the rubrics you designed to the assignment, and refine both your assignment and your rubric.

Key Points to Remember

Effective rubrics:
- Reflect course and unit objectives
- Clearly state the expected performance outcomes
- Allow for objective assessment across students
- Can include checklists, rating scales, and comprehensive descriptions
- Include a list of performance indicators for checklist rubrics

Rating scale rubrics include the following:
- A list of performance indicators
- A scale showing the level of achievement (eg, Excellent, Adequate, Needs Improvement)

Descriptive rubrics include the following:
- A list of performance indicators
- A scale showing the level of achievement (eg, Excellent, Adequate, Needs Improvement)
- A description of the performance expectations required to attain each level of achievement

Because periodic summative assessments are necessary throughout a curriculum, and we know that students with different learning styles may have different strengths, it can be useful to expand our repertoire of summative techniques. In addition to written and practical exams and term papers, Table 4-20 provides a number of options for you to consider.[64] Regardless of the strategy you select to assess your learners' performance, it must match the established behavioral objectives and the teaching strategies used and must include a mechanism for fairly and effectively judging performance.

Another type of assessment, *formative assessment*, refers to an ongoing process that allows instructors and

Table 4-20. Summative Assessment Alternatives to Written and Practical Exams

- Portfolios/work product
- Case reports/presentations
- Abstracts
- Graphic organizers, models, illustrations
- Poster presentation
- Reflective essays
- Self-assessments
- Self-selected projects
- Action plans
- Videotapes of skill performance
- Objective structured clinical skills exams and standardized patient exams

learner(s) to adjust instructional practices based on student feedback and performance.[62,76] Formative assessment indicates progress toward the accomplishment of the various objectives while there is still an opportunity to make adjustments in both teaching and learning strategies. Another purpose of formative assessment is to provide feedback to the instructor about teaching or presentation skills. Areas for improvement can be identified and strategies implemented. Because formative assessment, according to Popham[62] and others, is a planned, ongoing process, a variety of techniques can be used in the classroom and clinic.

Angelo and Cross[77] described a number of classroom assessment techniques that provide formative assessment in the classroom. We have adapted many of the classroom assessment techniques presented by Angelo and Cross[77] to assess different aspects of student learning in the clinical setting as well. Table 4-21 provides a number of these techniques, along with examples of how they can be adapted for use in the clinical setting. Each of these formative assessment approaches can provide valuable information that can be a useful adjunct to the final, summative assessment of performance in a particular clinical internship.

Table 4-21. Sample Formative Assessment Techniques With Adaptations for Use in the Clinic

Level of Assessment Using Bloom's Taxonomy	Name of Assessment Technique	Purpose	Description and Classroom Use	Clinical Example
Knowledge	Focused listing	To assess how well your learners can identify the most important terms or concepts of the presentation.	Ask your learners to take 2 to 3 minutes to make a list of the most important concepts related to the presentation.	In planning for an evaluation of a patient with complaints of dizziness, ask your student to list the essential components of the evaluation.
	Misconceptions/preconceptions	To assess whether your learners hold any preconceived notions about a topic that may interfere with learning.	Create a questionnaire to obtain your learners' perceptions on a particular topic in which misperceptions are often noted.	Given a particular diagnosis, and before entering a patient's room, ask your student to list his or her assumptions about the patient's current presentation and expected outcomes.
Comprehension	One-minute paper	To assess what your learners understand of the major concepts presented.	At the end of your presentation or during the last few minutes of a class, ask your learners to write down answers to these 2 questions: What is the most important point you learned today? What important question remains unanswered for you?	Before your student leaves clinic for the day, ask him or her to write down 3 new things he or she learned today and what questions remain for him or her. You can take it one step further and ask your student to research answers to what remains muddy when he or she goes home and be prepared to discuss it in the morning. Consider minimizing the intimidation factor by letting your student know you too will research the topic to ensure that you both learn from the questions raised.
	Empty outlines	To assess how well your learner captured the major points of the presentation.	Provide your learners with a partially completed outline of the presentation and ask them to fill in the rest.	Prior to starting a new patient evaluation, give your student a brief outline of the components of a history and review of systems. Ask him or her to complete the outline based on the initial evaluation he or she is observing. In a hand therapy clinic, give your student the diagnosis and patient history, and have him or her fill in the blanks to problem solve the type of splint that is appropriate for your patient. Give your student a brief outline of the components of a patient interview, history, and review of systems. Ask your student to observe your initial evaluation with a patient and complete the outline based on his or her observations. *(continued)*

Table 4-21. Sample Formative Assessment Techniques With Adaptations for Use in the Clinic (continued)

Level of Assessment Using Bloom's Taxonomy	Name of Assessment Technique	Purpose	Description and Classroom Use	Clinical Example
Comprehension	Muddiest points	To assess what remains confusing for your learners.	Ask your learners to take a minute and write down "what is the muddiest point?" or "what remains confusing or unclear?"	After your student observes a pediatric evaluation, ask him or her what he or she thought was the most confusing or difficult part of the evaluation, and then review or give resources to augment knowledge. Have your student keep a list of diagnoses seen during the day. At the end of the day or week, discuss the salient aspects of those diagnoses with which he or she is least familiar. Ask your student to research a number of possible interventions for these diagnoses. Have your student do a chart review and take a history of the patient. Then, discuss what remains muddy and offer knowledge and resources.
	Directed paraphrasing	To assess whether your learner fully understands the information and can put it into his or her own words (jargon-free). This may be particularly helpful when the learner needs to translate technical information to patient-friendly information.	Identify the audience for whom you want your learners to paraphrase information (eg, patient, family, community members). You can also ask the same learner/other learners to paraphrase the information for different audiencs (ie, patient, family, consulting professional, etc).	Before presenting the results of a complex evaluation to your patient, discuss the findings with your student. Then, have your student repeat the information in her own words to you as if she were speaking with the patient and his or her family. Have your student practice translating an MRI report sentence-by-sentence into laymen's terms so your student has practice explaining to a patient or family member what the radiology report means. Your student can look up any terms he or she is not familiar with to increase learning. Ask your student to review the patient's chart and summarize what the physicians and nurses reported in the past 24 hours as if he or she were speaking to a patient.
Application	Application cards	To assess your learner's ability to see the relevance of the information presented. It assesses his or her ability to link the theoretical concepts to real-world application.	Ask your learner to provide 3 possible applications, indicating that the goal is for him or her to come up with his or her own ideas of how the principle or procedure can be applied to practice.	After discussing a new treatment technique with your student, ask him or her to come up with 2 to 3 other applications for the same technique.

Table 4-21. Sample Formative Assessment Techniques With Adaptations for Use in the Clinic (continued)

Level of Assessment Using Bloom's Taxonomy	Name of Assessment Technique	Purpose	Description and Classroom Use	Clinical Example
Application	Concept maps	To assess your learner's ability to link the information together and make sense out of it. This may be particularly helpful in encouraging the learner to explore all possible diagnoses and interventions related to particular symptoms before narrowing the differential diagnosis.	Ask your learner to brainstorm terms and phrases related to a particular concept. Have your learners place the concept in a circle at the center and then draw lines to the different terms, demonstrating the relationship of the term to the concept. Ask your learner to link more than one concept together.	Have your student map out some alternative plans of care for your patient who recently had a stroke. Have your student consider the following possibilities at discharge: that he or she will be going home with limited family support, going to a nursing home with access to weekly therapy, or going to a rehabilitation setting. Have your student list all the findings of his or her evaluation and draw a map linking them to potential diagnoses.
Analysis	Pro and con grid	To assess a learner's ability to objectively analyze a decision, an issue, a policy, etc.	Ask your learner to write out a list of pros and cons related to the issue. Have him or her provide the rationale or evidence for his or her responses.	Have your student list the pros and cons for home health versus skilled nursing facility based on insurance limitations. Have your student list the pros and cons for which modalities may be most effective for treatment of a particular diagnosis. Have your student list the advantages and disadvantages of various orthotic devices for your patient who have neurological impairments. Have the student brainstorm as many interventions he or she can think of for the next patient, then write a list of pros and cons of each before deciding which ones to use.
	Categorizing grid	To assess the learner's ability to sort or categorize information.	Select several different categories useful for organizing information covered and the identify subordinate terms for each category. Scramble a list of terms under each category and ask your learner to categorize them appropriately.	Take 3 or 4 different screening tools that you use for your older adult with neurologic impairments, and scramble the different components of the tools. Then, ask your student to categorize them into balance, motor control, reflex testing, cognition, etc. Then, ask your student to look at the tools as a whole and determine which tools screen for what components of neuromuscular function. Have your student organize a list of statements into the subjective/objective/assessment/plan (SOAP) format.

(continued)

Table 4-21. Sample Formative Assessment Techniques With Adaptations for Use in the Clinic (continued)

Level of Assessment Using Bloom's Taxonomy	Name of Assessment Technique	Purpose	Description and Classroom Use	Clinical Example
Analysis	Analytic memos	To assess the learner's ability to problem solve and communicate his or her decision-making processes	Select a typical problem and the provide the necessary background information. Ask your learner to prepare a memo describing the steps he or she took in analyzing the problem.	After evaluating a complex patient, ask your student to determine what type of assistive devices might be necessary for your patient. Ask him or her to write an analytic memo describing how he or she made these decisions. Your patient has an amputation with skin breakdown. Have your student outline how this may have happened; how it may affect the current plan of care including prosthetic wear and ambulation; how it might be corrected/prevented; and how the patient's level of cognition might play a role. Have your student write a letter to the insurance company justifying the type of wheelchair system your young patient with cerebral palsy spastic quadriplegia might need. Be sure the analysis includes why less costly alternative systems might be inappropriate.
Synthesis	Documented problem solving	To assess the learner's reasoning process in developing solutions. It also encourages self-assessment and self-awareness of problem-solving abilities. This may be particularly helpful in developing a differential diagnosis.	Select a problem, case, etc. Ask your learner to write down all the steps he or she took to solve the problem—all of the decisions he or she made and why he or she made those decisions.	Give your student a history of a patient with a complex neurological problem and limited family support. Tell him or her that your patient is being discharged home and ask him or her to determine what needs to be accomplished to enable him or her to be safe at home. Ask him or her to document his or her solution and include rationale for whatever he or she decides. Review the lab values of a patient in ICU. Ask your student to articulate how he or she might modify the current plan of care based on these lab values. Have him or her justify his or her decisions. Patient with increased blood pressure is "on hold" by nursing. Have your student list why/how increased blood pressure impacts activity and what is the safe range.
	Invented dialogues	Helps assess a student's ability to synthesize his or her knowledge into a structured dialogue. This may be helpful for learners preparing for challenging communication issues (eg, speaking to a physician or insurance company, providing feedback).	Select a problem, issue, or theory that lends itself to a dialogue format. Ask your learner to write a short dialogue between 2 people (eg, doctor and patient; therapist and family member) on the topic. Have your learner practice the dialogue. Assess its completeness and the quality of the reasoning (learners can do this in small groups, assessing each other).	Tell your student that the insurance company has just denied your patient's claims for further reimbursement and you would like him or her to call the insurance company to explain why additional sessions are necessary. Have him or her create the dialogue he or she envisions will ensue. Develop a scenario where an MD, orthotist, and PT all have different opinions on a patient's case. Have your student create a dialogue that presents each of these differing views in preparation for a team meeting. In preparation for contacting a physician to recommend an MRI for your patient, ask your student to create a dialogue that considers the doctor's perspective and how the student might respond to an adverse response.

(continued)

Table 4-21. Sample Formative Assessment Techniques With Adaptations for Use in the Clinic (continued)

Level of Assessment Using Bloom's Taxonomy	Name of Assessment Technique	Purpose	Description and Classroom Use	Clinical Example
Evaluation	Self-confidence surveys	To assess the learner's level of confidence in his or her skills or abilities. The more confident a learner is, the more likely he or she will follow-through.	Create a list of competencies that are important to having a successful performance, and ask your learner to rank how confident (ie, 0 = not at all confident to 5 = very confident) he or she feels in applying his or her knowledge and skills.	During orientation, provide your student with a list of treatment techniques typically used in the clinic, and ask him or her to rate his or her level of confidence in performing each (0 = not comfortable, 5 = performed in past without difficulty). This will help you determine how much guidance and supervision you might expect to provide early on.

Adapted from Angelo TA, Cross KP. *Classroom Assessment Techniques: A Handbook for College Teachers.* 2nd ed. San Francisco, CA: Jossey-Bass; 1993. With input from Ellen Goldman, EdD, and Jennifer Halvaksz, PT, DPT, George Washington University, Washington, DC. MRI indicates magnetic resonance imaging; PT, physical therapist.

Critical Thinking Clinical Scenario

You are preparing to provide a full-day workshop on both effective instruction and assessment. You will be presenting some information about classroom assessment techniques. You would like to include at least 2 formative assessments to determine whether the audience has grasped the major concepts and whether they can apply them to their own practice when they leave the workshop.

Reflective Questions

Review the examples provided:
1. Which 2 assessment techniques might you consider using?
2. Why did you select those 2 techniques?
3. What other techniques might you consider?
4. Which ones would not be appropriate in this context? Why?

Effective formative assessment can provide valuable feedback to everyone involved in the teaching-learning situation. Formative assessments should be ongoing throughout a course, a workshop, a clinical internship, or any teaching-learning situation. In designing effective formative assessments, you will want to consider your learning objectives and where along the taxonomy you expect your learner to perform. You will want to identify what it is they learned and what they thought was important as well any areas of difficulty or confusion. Some equate formative assessment with feedback, and for feedback to be effective, it must be both diagnostic and remedial. That is, feedback should be designed not only to help your learners understand their weaknesses but to provide them with strategies for improvement. As noted, assessment should also be a reciprocal process. It is equally important for you as the instructor to ask for feedback on your teaching strategies to know whether you are meeting your goals as well as the needs of your learners.

Finally, providing feedback to the audience can be beneficial both to you as the instructor and to your learners. As a means of formative assessment, we often ask our audiences to respond to the following questions regarding the teaching strategies being used: What is most helpful to your learning? What is least helpful to your learning? We then compile a list of the most and least helpful and report back to the audience. Inevitably some of the strategies learners listed in the "most helpful" category are also seen in the "least helpful" category. Knowing what we know about the typical audience (ie, the 4 different types of learners in every audience), this makes sense. It is also quite surprising to the learners when they see that what they dislike about the teaching strategies someone else finds helpful. This feedback helps learners understand why we use a variety of strategies when we teach—some they may find most effective and some they may not.

Key Points to Remember

There are 2 types of assessment:
- Summative
- Formative

Summative assessments occur at the end of a course or a unit of instruction and result in a grade.
- Focuses on determining whether the student learned the material and whether the instruction was effective.

Formative assessment occurs throughout the course and allows instructors to adjust their instruction along the way, based on student feedback and performance.
- Indicates progress toward the accomplishment of the objectives while there is an opportunity to make adjustments in both teaching and learning strategies.
- Provides feedback to the instructor about teaching or presentation skills.

The previous examples of formative assessments have emphasized classroom assessments that could be modified for use in the clinic. There are also some formative assessments that clinicians use specifically in the clinical setting to assess their students' progress toward the specific objectives for the various internships. Frequently used tools in physical therapy practice include[77]

- *Weekly Planning Form*: These forms require students to assess what they did well during the previous week, identify their areas of weakness, and develop goals for the upcoming week. In addition to ensuring that ongoing formative assessment occurs and assisting the clinical instructor in planning the learning situation for the student, these forms also promote the following:

  o Self-directed learning

  o Self-assessment

  o Reflective practice

- *The Anecdotal Record and Critical Incident Report*: The anecdotal record is used to document both positive and negative incidents. The advantage of this report is that it separates fact from opinion and interpretation. Essentially, it requires the clinical instructor to objectively document the student's behavior and then identify the results of that behavior. The critical incident report is typically used to document a series of events. Similar to the anecdotal record, the critical incident objectively documents the student's behavior and the results of that behavior. What differentiates the critical incident is that it also identifies consequences if the behavior should persist.

- *Learning Contract*: Learning contracts are usually developed in response to a series of incidents often documented by critical incidents. The contract makes the expectations of appropriate performance explicit and clarifies both expectations and consequences of specific student behaviors. Learning contracts generally require students to sign the contract and include a timeframe for achievement.

- *Midterm Clinical Performance Instrument*: This form is used by many physical therapy programs across the United States. The form requires both the clinical instructor and the student to independently to rate the student's performance on 18 cognitive, psychomotor, and affective behaviors along a continuum from beginner performance to entry-level performance and beyond. In addition to the clinical instructor assessing the student's performance, the student is expected to complete a self-assessment both at the midpoint and endpoint of the clinical internship. The student and clinical instructor then compare student assessment to clinical instructor assessment and discuss any discrepancies. Besides being an effective assessment instrument, it is an excellent opportunity for clinical instructors to provide direct feedback to students and for students to hone their self-assessment skills.[64]

As you reflect back on factors to consider when you are preparing to teach, you probably realize how much more complicated it is to plan an effective instructional experience than you first thought. From needs assessment through learning expectations, objectives, motivational hooks, content and content boosters, summary, and assessments, there are so many important components. Still, there is more to consider when planning truly optimal instruction.

Timing and Sequence

Depending on the time period allotted to your presentation, you can include more or less lecture, more or less active techniques, and more or less small group activities. The key point to remember is that certain factors are essential regardless of the amount of time:

- Motivational hook

- Objectives

- Content

- Content booster

- Summary

You realize that you need a motivational hook to pull your learners' attention from the environment to your instruction. Behavioral objectives begin to provide context for the learners so they know where you are planning to take them. Because both the motivational hook and objectives occur at the beginning of your instruction, they benefit from the primacy effect. The information presented in the early moments of instruction is most likely to be remembered. Interesting content boosters and active strategies help maintain focus and engagement during the middle of the instructional period when attention is most likely to wane. The summary allows you to rely on the recency effect to emphasize the key points at the end of the instructional period, the second most powerful position for learning.

You also want to allow some time for questions throughout or at the end of the instructional period. You do not want to speed up your delivery in hopes of finishing everything in the allotted time. You want participants to be engaged and to have time to process and integrate the information. How do you know how long something will take? The obvious answer is often overlooked: you time it! Practice your instructional activities, and time your presentation. Do a "walk-through" of your active strategy with a stopwatch running. When you participate in various activities in school or at conferences, time them and begin to keep track of how long things take. A common mistake of the novice instructor is too much content/activity for the time allotted. Remember, a good rule of thumb is that any active learning strategy

you design will likely take longer than you initially anticipate. We will discuss how you can modify and adapt presentations for different settings and time frames in Chapter 5.

Although you, as the expert on your topic, will determine how best to sequence the content you are presenting, there are a few general guidelines to maximize your effectiveness. As a general rule, present the "big picture" first and then the details.[29,32] This provides context for your learner and makes sense when we consider what we discussed in Chapter 3 about the importance of meaning in grabbing a learner's attention. If we create a context, the big picture, then the details that follow have a place to connect. It is also important to consider the natural, logical sequence of material, if there is one. For example, in this chapter on optimizing instruction, the content followed the logical progression found in effective presentations. We began with a scenario about designing a community-based presentation. We then proceeded to describe the essential elements in the same order as they would occur in the actual design and delivery of an effective presentation.

Room Arrangement and Resources

There are 2 final factors to consider when designing optimal teaching-learning experiences. The physical environment, which includes room arrangement, chairs, tables, space for movement and/or small group work, will influence your presentation. If you are conducting an in-service on spinal mobilizations and you plan to have participants demonstrate these techniques in pairs on each other, you need plinths and adequate space. If you are teaching about conflict-resolution techniques and plan for small groups of participants to do role plays, you will need moveable chairs. The more you know about the setup, and the earlier you obtain this information, the easier your preparation will be. Finally, you want to consider technology and other educational resources. Will you have access to the Internet connection, PowerPoint, a liquid crystal display (LCD) projector, newsprint pads, markers, white boards, handouts, and/or instructional models, etc?[3,5,6] It is important to develop a list of resources you will need to support your presentation, and it is equally important to develop a plan B in case those resources are not available or are not working properly. Though room arrangements can at times be limiting, a little planning and creativity may help you overcome any less than desirable accommodations.

Regardless of the topic, room arrangement, and selection of instructional supports, the key to a successful teaching-learning experience is planning and practice. Test the equipment, photocopy the handouts, visit the room where you will teach, test out your technology, and obtain all necessary materials before the day you present. Practice your instruction, time the complete presentation, and time the active strategies.

Critical Thinking Clinical Scenario

You have been asked to conduct an anatomy review of the shoulder, hip, and knee for student physical therapists assigned to your facility. Many of the patients they will treat have had surgeries in these areas. The students range from first-time interns to students on their final internship. You have a total of 3 hours, divided as you choose, to present the information.

Reflective Questions

1. What goals/expectations might the learners have in terms of exposure, acquisition, or integration?
2. How will you divide the time? What factor(s) influence your decisions?
3. What motivational hooks and content boosters might you use?
4. What active strategies could you use to facilitate learning?
5. What summary strategy could you use?

Summary

In this chapter, we provide strategies to help you develop effective presentations that will grab your audience's attention and maintain it throughout. Table 4-22 provides a summary of the essential elements of effective presentations along with questions you might ask yourself to ensure that your design includes knowing your audience; assessing their needs, creating well-written behavioral objectives to help focus your content, balancing content and process to allow for information processing, providing motivational hooks to grab your audience's attention, using content boosters and active learning strategies to maintain attention and reinforce the content, developing formative and summative assessments to optimize teaching and learning, and providing summaries to capitalize on the recency principle.

Table 4-22. Keys to Developing Effective Presentations

Elements of an Effective Presentation	Why They Are Important
Knowing your audience	Remind you to consider that most audiences include "watchers and doers" as well as those who prefer theory and concrete examples; knowing where along the continuum from novice to expert your learners fall will help you determine the appropriate teaching strategies to use
Needs assessments	Help you determine the specific needs of your audience
Behavioral objectives	Help you "begin with the end in mind"; they provide context and help you create a focused presentation
Focused content	Less is more and covering is not learning
Information processing	Rules of thumb Chunk content Balance content and process time
Motivational hooks	Grab your audience's attention
Content boosters	Reinforce the learning
Active learning strategies	Engage your audience and enhance retention
Formative assessments	Help you determine whether your learners are learning what you planned to teach and help you refine your teaching to meet the needs of your learners
Summative assessments	Help you determine whether the behavioral objectives established at the start of the presentation were achieved
Summaries	Help to ensure your learners retain the key points from your presentation by taking into consideration the concept of primacy and recency

Key Points to Remember

Questions to help guide effective teaching:

- Motivational hook
  - Does it have relevance, emotion, and meaning?
- Objectives
  - Are they observable and measureable?
- Content
  - Is the sequence from general to specific and logical?
- Content boosters
  - Do the content boosters engage watchers and doers? Is there something for the people who appreciate anecdotes and examples? Are theory, concepts, and references included?
  - For your learner at the exposure stage, are you providing sufficient and balanced content and process?
  - For your learners who are developing competency, are you guiding them through practice and feedback?
  - For your learners approaching mastery and expertise, are you challenging them through independent application of the content/skills being taught?
- Formative assessment
  - Do you have a way of monitoring or checking for understanding, such as asking questions about or requesting a demonstration of material presented?
- Summative assessment
  - Does the strategy that you selected to assess your learners' performance match the established behavioral objectives/learning outcomes?
  - Does the strategy you selected to assess your learners' performance match the teaching strategies used?
  - Does the assessment follow a comprehensive blueprint?
  - Does the assessment include a mechanism for fairly and effectively judging performance?
- Summary
  - Do you provide an opportunity to highlight the key points of instruction at the end of the instructional period?

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